Water Reuse
Best Management Practices

Nationally, Arizona and Flagstaff

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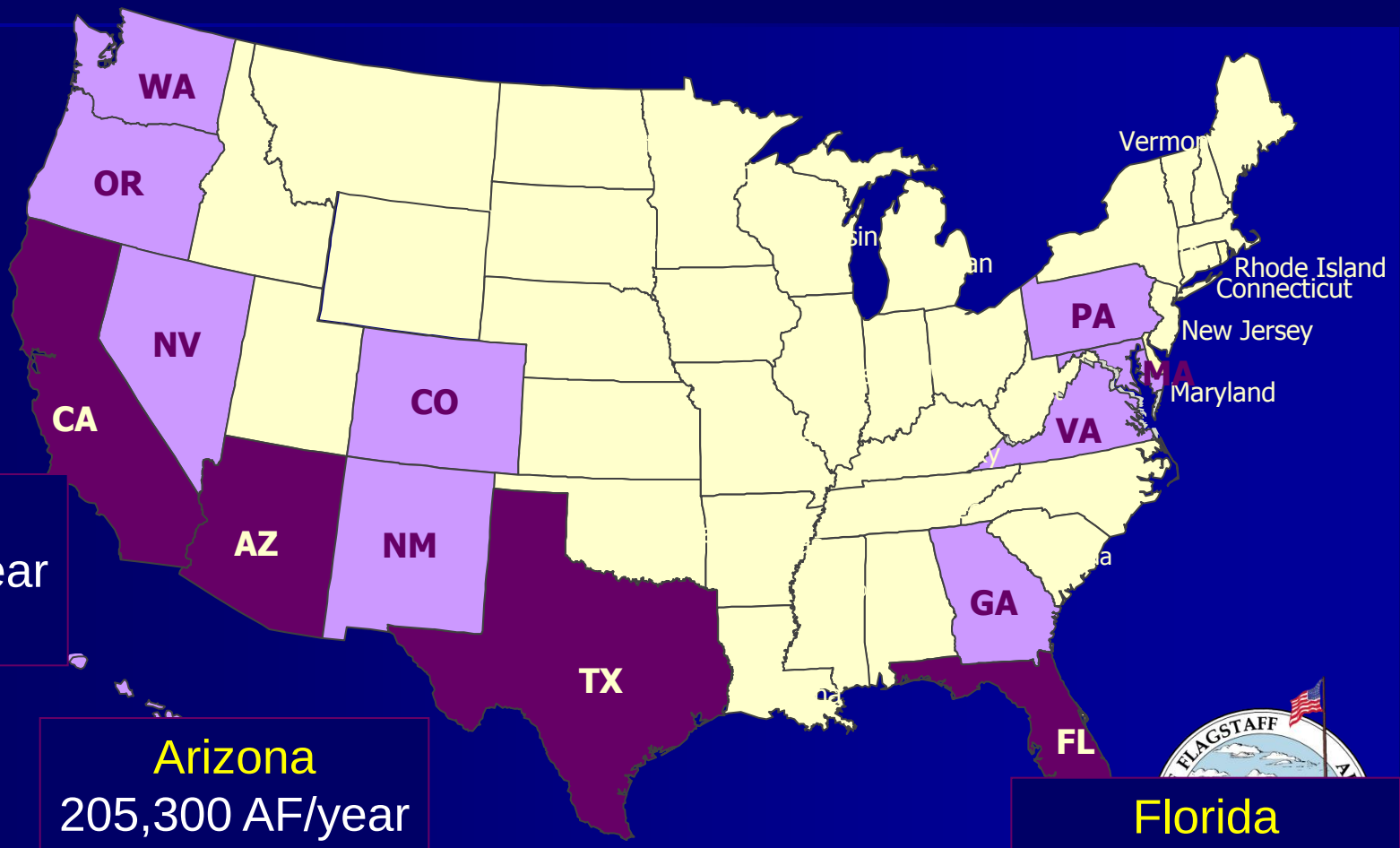
Reclaimed Water Forum
December 5, 2011

Arizona is a Leader

90% of reuse occurs in just four states



California
616,100 AF/year
550 MGD

Arizona
205,300 AF/year
183 MGD

Florida
742,700 AF/year
663 MGD

COMMON
Best Management Practices

DISPOSAL: discharge into rivers, ocean or dry washes

TREATMENT: primary, secondary, filtration & disinfection (tertiary)

COMMON
Best Management Practices

DIRECT Reuse: "purple pipe" distribution, irrigation, power generation, environmental

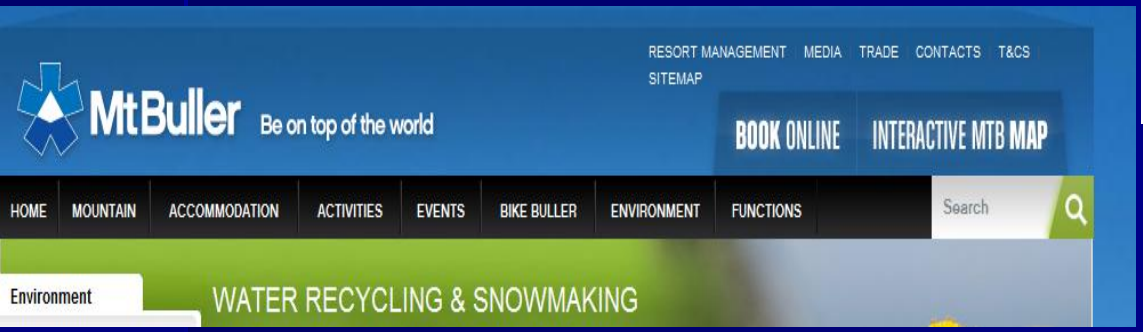
INDIRECT Reuse: recharge groundwater or surface water reuse co-mingled supply

2008
Bejing Olympics
Birds Nest

Orange County Groundwater Replenishment System

78,400 AF/year or 70 MGD

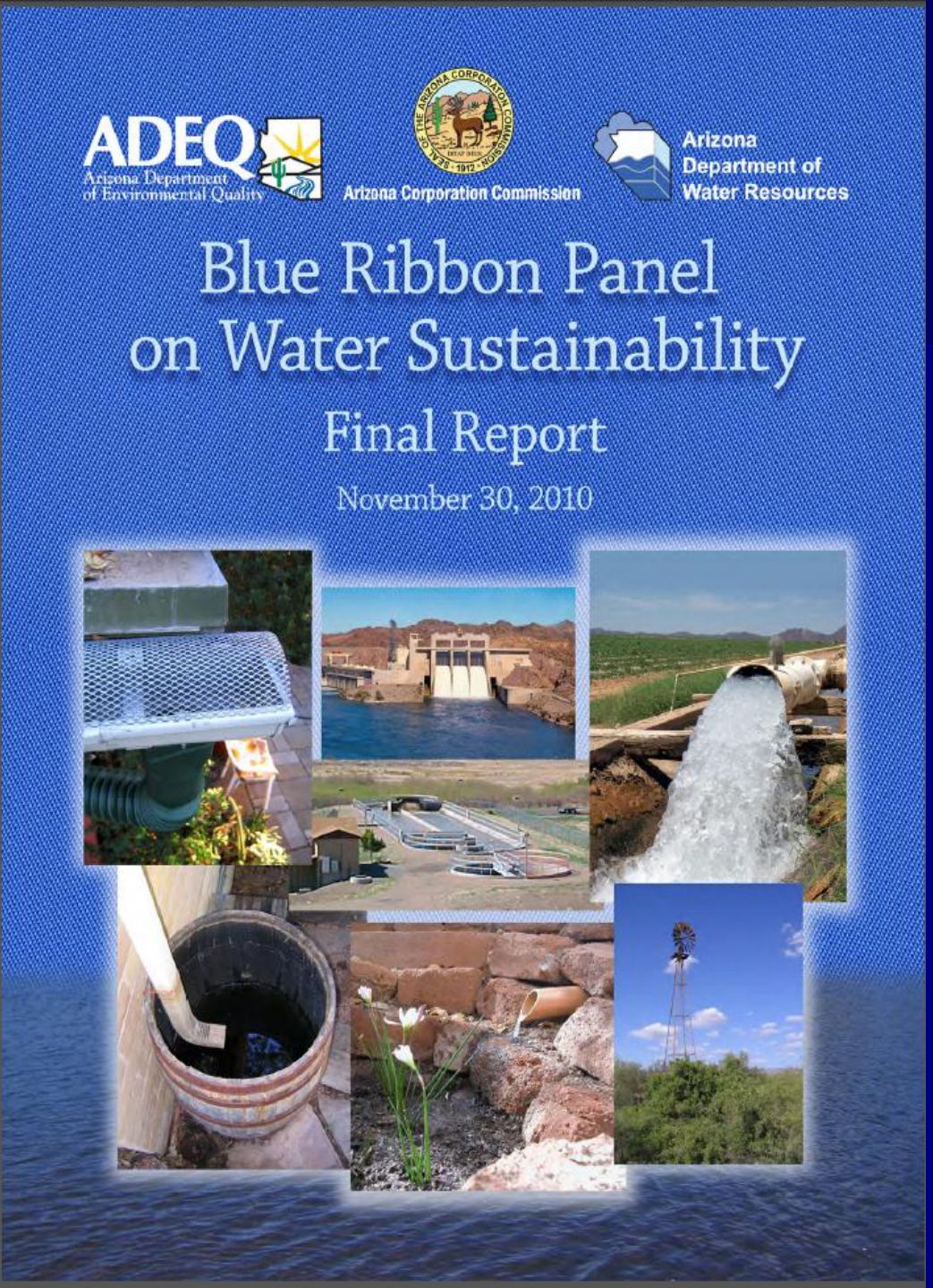
Mt Buller & Hotham
Ski Resorts in Australia



San Antonio Riverwalk

35,000 AF/year or 31 MGD

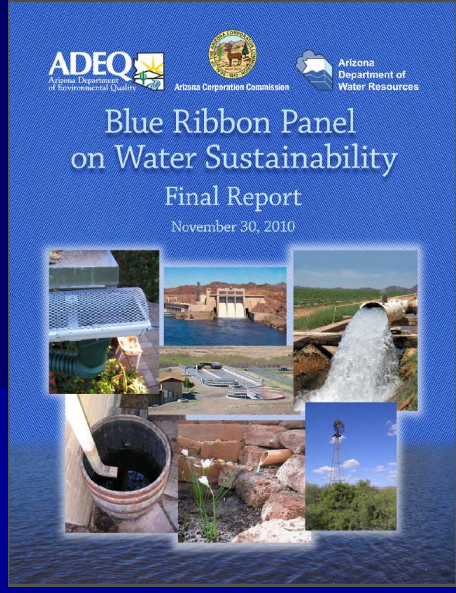
Tampa Bay Area
167,000 AF/yr or 149 MGD

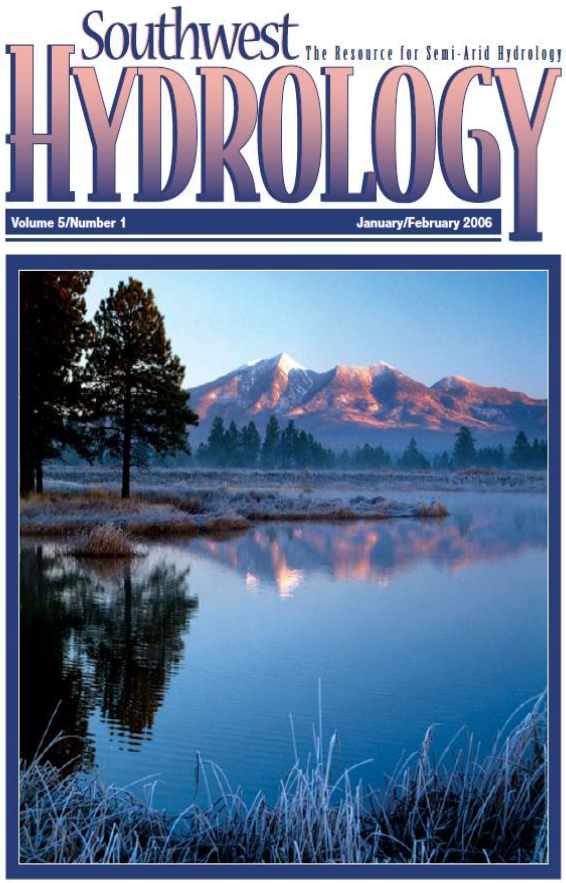


Governor's Blue Ribbon Panel 2010

1. Legal & Regulatory Framework
2. Current Status & Potential Opportunities
3. Recommendations
   - Education
   - Standards
   - Research
   - Regulatory Improvements
   - Incentives

Arizona Current Status
permitted for water quality





309 Water Reclamation Facilities in Arizona

203 Authorized for Reuse
(including 17 in Coconino County)

ADEQ Arizona Department of Environmental Quality

CITY OF FLAGSTAFF · ARIZONA · ESTABLISHED 1882 ·

Arizona Current Status
Permitted for water management

29 Underground Storage Facilities permitted to recharge reclaimed water (>263,000 AF/year or 235 MGD)

3 Groundwater Savings Facilities permitted to irrigate agricultural fields with reclaimed water (>135,800 AF/year or 121 MGD)

Effluent = Az Supreme Court case separate legal type of water and defined who owns the water

ARIZONA DEPARTMENT OF WATER RESOURCES
SECURING ARIZONA'S WATER FUTURE

Flagstaff Current Status


Lake Elaine
Continental Country Club

Wildcat Hill (1973) and Rio (1993) Reclamation Facilities

treat up to 11,200 AF/year or 10 MGD (~5.6 MGD today)

City's Obligation: Type 3 Agent Reclaimed Water Permit for Class A+ quality; Aquifer Protection Permits; AzPDES Permits

Customers: >60 directly delivered reuse sites or end users

(irrigation, construction, industrial, amenity lakes, and environmental benefits)

Pine Canyon golf course


Reclaimed Fire Hydrant

Flagstaff Current Status


Lake Elaine
Continental Country Club

Direct Reuse started in 1973, in 2010: 2,031 AF or 1.8 MGD

(equivalent of replacing the need for 3 additional water supply wells)

(20% of the City's total water use)

Discharge in to Rio de Flag, in 2010: 4,281 AF or 3.8 MGD

aquifer recharge estimates, in 2010:

Rio WRF: 1,165 AF or 1.0 MGD

Pine Canyon golf course

Master Planning the future:

expand from current 5.6 MGD to

> 13 MGD at build-out


Reclaimed Fire Hydrant

SUMMARY
Best Management Practices

- Reuse the water supply, not dispose
- Flagstaff has invested huge sums of $$ to treat reclaimed water highest quality permitted by law
- 20% of community's total water use is reclaimed water
- Reclaimed water supply will grow with time
- Flagstaff uses established Best Management Practices
  - Direct or Indirect reuse of reclaimed water

Community Questions

- What are the human health risks, if any, of trace amounts of pharmaceuticals, etc in reclaimed water?
- What is the existing & future regulatory framework?
- What are advanced treatment technologies to remove pharmaceuticals, etc and their costs?